DOCUMENT RESUME

ED 268 668 EA 018 411

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TITLE Copyright Issues in Computer-Assisted Instruction.
PUB DATE 85
NOTE 12p.; In: Jones, Thomas N., Ed., and Semler, Darel P., Ed. School Law Update 1985. National Organization on Legal Problems of Education, 1985 (ED 018 409).
PUB TYPE Legal/Legislative/Regulatory Materials (090) -- Viewpoints (120)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Compliance (Legal); *Computer Assisted Instruction; *Computer Networks; *Computer Software; *Copyrights; Elementary Secondary Education; Federal Legislation; *Legal Responsibility; *Microcomputers; School Law
IDENTIFIERS *Copyright Law Amendments 1980

ABSTRACT

The 1980 Amendments (P.L. 95-517) to the updated Copyright Law of 1976 contain two major provisions pertaining to computers. First, only one copy of the master copy of a piece of software may be legally duplicated--the backup copy made by the owner for archival purposes. Second, the only other legal copy of the master copy owned by the user is that copy reproduced by inputting the software into the computer in order to utilize the program. The amendment clearly prohibits the unauthorized duplication of copies of a computer program for distribution and use by other than the owner of the master copy. However, it does not directly address (1) using a single-loading master copy to boot up sequentially two or more microcomputers or (2) using a slightly modified master copy in a network of microcomputers. There are at least four other sources or tests for assessing the legality of these software uses: (1) the market effect test, (2) the intended use test, (3) the simultaneous/sequential users test, and (4) the fair use test. However, the otherwise harsh implications of copyright restrictions for the schools are mitigated by (1) licensing agreements that may provide financially beneficial options to schools, (2) technological advances making duplications of tangible copies increasingly difficult, (3) software producers designing programs specifically for use in networks, and (4) greater amounts of high quality/low cost software by nonprofit producers. Until these conditions become more prevalent, educators need to know and abide by the restrictions placed on the use of instructional software by the copyright law. (MLF)

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Copyright Issues in Computer-Assisted Instruction

Virginia M. Helm

Though computers have been in some schools for nearly two decades, it is the arrival of the microcomputer that has allowed — or forced — educators to incorporate computer-assisted instruction into their classrooms. As these little machines have begun whirring and clicking in classrooms, libraries and labs, educators have responded with the range of human emotions ranging from excitement to dread. Whatever their emotional state, however, many computer-using educators have already begun a pattern of illegal use of computers in the school environment. Some do so in blissful ignorance, others with vague intuitions of wrong-doing, and regrettably a few knowingly and blatantly ignore the frustrating restrictions contained in the copyright law.

What are the copyright restrictions imposed on the use of computer hardware and software? And what are the legally questionable if not outright unlawful uses of instructional software? Many educators know or at least sense that making duplicate copies of a disk is both ethically and legally dubious. But most would be incredulous to learn that they are probably violating the copyright law when they sequentially boot up a series of microcomputers with one disk, thereby enabling multiple student users to access a program (now in the computer's memory) for which there is only one purchased disk. If confronted, these educators would probably respond: "But I'm not making duplicate copies. How can I possibly be breaking the law?" Likewise, in a school system where one or more teachers has acquired some degree of sophistication with microcomputers, we may find that several students are simultaneously accessing one program via a network of linked micros. This arrangement, too, could be illegal, depending upon several variables to be explored below.

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What the Copyright Law Says

In order to understand why these and other seemingly innocuous uses of instructional software are illegal or at least legally questionable, we must look first to the copyright law itself. The 1980 amend-

ments (P.L. 96-517) to the comprehensively revised, updated copyright law of 1976 (P.L. 94-553) contain two major provisions pertaining to computers.

Title 7, section 10 contains the definition of a computer program.

A "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.

How a computer program may be used is defined in Title 7, section 117.

Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

(1) that such new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner.

A close reading of section 117 discloses three different referents for the term "copy." First, subsection 1 refers to the intangible copy in the computer's memory (ROM) made when the user inputs a piece of software into the computer. That copy, in most instances, self-destructs when the computer is turned off or when the user otherwise removes it from the central storage of the computer. Second, subsection 2 refers to the tangible, reproduced back-up copy made by the owner for archival purposes. And third, the opening qualifier of section 117 refers to the owner's "copy of a computer program," by which is understood the tangible piece of software, usually on disk,

purchased by the user or acquired with the purchase of the computer. To simplify our analysis, this user-owned copy will be referred to as the master copy and the tangibly reproduced copies will be referred to as duplicate copies.

Understanding the Copyright Law

The almost brutal specificity of section 117 has not precluded the differing — even contradictory — legal constructions one expects in applying any law to specific situations or practices, but the law is clear on one point: absent permission from the copyright owner, it is illegal to make duplicate copies of a computer program for distribution to and use by anyone other than the owner of that master copy. Conversely, the *only legally duplicated copy* of the master copy of a piece of software is the one back-up copy made by the owner for archival purposes. This provision was intended to protect software users by ensuring that they will have a working copy of their program if the master copy is damaged or destroyed and must be sent to the manufacturer for repair or replacement.

The obvious rationale for prohibiting the duplication of copies derives from the purpose of copyright protection as expressed in the Constitution: to protect the property interest of creative individuals by "securing for limited time to authors and inventors the exclusive right to their respective writings and discoveries." Congress, however, has been obliged not only to protect the financial and intellectual interests of creative people but also to provide reasonable public access to copyrighted material, especially for the educational purposes of teaching, research and scholarship. Thus, section 106 of the copyright law provides for the exclusive rights of the copyright owner and sections 107 and 117, respectively, provide for "fair use" by educators and for (very) limited copying of computer programs.

While section 117 (2) permits the making of a single back-up copy, it should be emphasized that the law allows only the *owner* of a master copy to make or authorize the duplication of the back-up copy. That eliminates, then, the duplication of one or more copies of a piece of software obtained by rental or loan or for preview purposes, since the user in those cases is not the owner of the master copy. Furthermore, the back-up copy is legal only as an archival copy, not as a working copy to be used by someone else in another computer.

Section 117 (1) describes the only other legal copy of the master copy owned by the user: that copy reproduced, in layman's terms, by inputting the software into the computer in order to utilize the program. Now the response of most laymen to this provision is likely to be amazement that (1) the inputting of a piece of software would

be considered the making of a copy and (2) our legislators felt the need to include and protect such an obvious use. The rationale for this seemingly unnecessary provision is at least partially explained by the definition of the word "copy" contained in the copyright law. Section 101 defines "copies" as "material objects . . . in which a work is fixed. . . ." And "[a] work is 'fixed' . . . when its embodiment in a copy . . . is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration."

Given these definitions, the authors of the CONTU Report,[1] on which Congress relied heavily in drafting section 117, concluded that the intangible computer program stored in the computer's memory in machine-readable form constitutes a reproduction from the tangible form of the program existing on a disk, tape or microchip. In order for the computer to perform its intended functions, a computer program must be transferred from its tangible form to the computer's memory for processing. Because a program in the memory of some computers can be accessed *and copied* by a user at a connecting terminal, and because it may be repeatedly reproduced or accessed, that intangible copy of a computer program existing in the machine's memory is considered "a copy" of a computer program.

Legal Principles for Assessing Legality of Software Use

Section 117 of the copyright act clearly prohibits the unauthorized duplication of copies of a computer program for distribution and use by others than the owner of the master copy. But it does not directly address a number of other uses of software commonly practiced or at least questioned in the schools: 1) using a single-loading master copy to boot up sequentially two or more microcomputers in a classroom or computer lab; and 2) using a slightly modified master copy in a network of microcomputers, enabling a group of students simultaneously to access that same master copy at their own stations. Educators concerned about the legal use of software in their schools are not, fortunately, dependent solely upon section 117 for delineating the legal parameters of acceptable software use. There are at least five other sources or tests for assessing the legality of the software uses mentioned above.

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1. National Commission on New Technological Uses of Copyrighted Works, Final Report (Library of Congress 1976).

The Market Effect Test

Perhaps the most basic and reliable test for evaluating the legality of a questionable use of instructional software is the "market effect test." Since an essential function of the copyright law is to protect the financial interests of creative people, a logical question to ask about someone's use of copyrighted material is: "Does this use deprive the copyright owner of rightful profits?" The making and distribution of duplicate copies from a master copy of a computer program not only violates section 117 but fails the market effect test by depriving the copyright owner of profits otherwise earned from the sale of an equivalent number of copies of that program. By the application of this test, furthermore, we begin to see why some of the other educational uses of instructional software are questionable if not illegal. A teacher, for example, who sequentially boots up a dozen microcomputers with one master copy of an instructional program, is making accessible to twelve students simultaneously that one copy — thereby depriving the copyright owner of profits from the sale of eleven additional copies of the program that the school would otherwise have needed to purchase in order to service all twelve students at once. Such use, then, unless authorized by the copyright owner or by accompanying license, fails the market effect test. Likewise, a computer program designed for use in a single microcomputer but modified to run in a network of microcomputers deprives the copyright owner of profits from the sale of the number of copies equivalent to the number of stations being used in the network. The network accessing of a single-user program, then, also fails the market effect test.

The market effect test, conceived in layman's terms, becomes the Golden Rule for Computer Users, attributed to Joseph McDonald: "Take not from others to such an extent and in such a manner that you would be resentful if they so took from you." In other words, trade places with the producer/copyright owner and then ask yourself how you would feel about another individual's use of your program. If you would resent the use in question, it is because you are losing profits, and therefore, that use is certainly questionable and probably illegal.

The Intended Use Test

The second test derived from copyright law is the "intended use test" which complements the market effect test by raising the question of the design of the program and the intention of its designer. This intended use test is especially helpful in resolving questions about the legality of networking computers. Specifically, if the pro-

gram is *designed* and therefore intended to serve a network, reason dictates that such a use would not violate the copyright law. If, however, the program is designed to be used by a single user at a single microcomputer, and it is modified to serve multiple users in a network, it is not being used as intended — thereby failing the intended use test. The latter example, by the way, has already been shown to fail the market effect test, making its legality doubly suspect.

The Simultaneous/Sequential Users Test

A third test suggested by some legal experts, most notably Daniel Brooks, distinguishes between simultaneous and sequential users.[2] This distinction further sharpens the legal analysis of such practices as networking and sequentially booting up a series of microcomputers with one disk. Essentially, this test renders legally acceptable the use of a master copy by several persons as long as they are accessing the program one at a time and not simultaneously. The rationale for this construction of the copyright law is based on the right of the *owner* of the master copy to do with that program what he or she wishes, as long as no duplicate copies are made (beyond the permissible back-up copy). That means, for example, that the owner of a Wordstar program can loan the copy to any number of individuals — one at a time. In this situation, neither the owner of the program nor the sequential users of the program loaned to them would be considered in violation of the copyright law.

Applying this principle to the school setting, a teacher with one master copy of a piece of instructional software might legally allow twelve students to use that master copy *one at a time* without fear of violating the copyright law — though allowing a dozen students to access that master copy simultaneously through a network or sequentially booting up a dozen microcomputers would constitute a probable copyright infringement. This test and the reasoning on which it is based, however, is not as unassailable as the two previous tests. It is true that the owner of a master copy may legally choose to loan that copy to one or more individuals for temporary use. And on an individual basis, the extent and impact of this practice are so miniscule as to render it inconsequential. But in a classroom setting, the distinction between sequential and simultaneous multiple users begins to blur as we consider its impact. Just how different in effect is the teacher who allows a dozen students to access simultaneously a

2. See article by Brooks, *Fair Use of Educational Software* in V. Helm, Software Quality and Copyright: Issues in Computer-Assisted Instruction (1984).

modified piece of software via a network from a teacher who allows a dozen students to access one at a time his or her master copy of that same program? Both practices result in the very proliferation of users that section 117 was intended to control. In short, the distinction between sequential and simultaneous users is interesting and perhaps helpful but is not likely to produce the most convincing evidence for either prosecutor or defendant if and when a software copyright case involving multiple users comes before the courts.

The Fair Use Test

The fourth test for assessing the legality of software use in the schools involves the application of the "fair use" concept. Unlike the three previous tests which are legal principles derived secondarily from the nature and function of the copyright law, "fair use" is a concept defined explicitly in section 107 of the Copyright Act. The concept of fair use is intended to balance the interests of copyright owners with the needs of others for access to copyrighted material. Educators are the prime but not the sole beneficiaries of this provision; limited access is made available not only to researchers and teachers but also to media reporters who review, report and comment on copyrighted works. In determining fair use, the following four factors are considered.

1. The *purpose and character* of the use, including whether the copied material will be for nonprofit, educational use or for commercial use; however, the courts have already found absence of financial gain itself insufficient for a finding of fair use.

2. The *nature* of the copyrighted work, with special consideration given to the distinction between a creative work and an informational work. For example, copies made of a newspaper or newsmagazine column merit less protection than copies made of a musical score or a short story. Copies made of material prepared for classroom consumption merit *more* protection than copies prepared for public consumption. At least part of the rationale for this stems from the market effect test. A teacher who photocopies a workbook page or a textbook chapter, for example, is depriving the copyright owner of sale profits in a way that he or she does not deprive a copyright owner of sale profits by the copying of one page from the daily paper.

3. The *amount, substantiality or portion* used in relation to the copyrighted work as a whole. This factor requires consideration less of the number of lines or pages copied than of 1) the proportion of the larger work that is copied and used and 2) the significance of the copied portion. Ten lines copied from a twenty line poem is qualita-

tively different from the reproduction of ten lines from a twenty page story or a 200 page book. And ten lines containing the "essence" of a literary work is regarded differently than ten lines selected and reproduced to illustrate a less significant point.

4. The effect of the use upon the *potential market* for the value of the copyrighted work. This, for many copyright experts, is the most critical factor in determining fair use of computer software and it serves as the basic principle from which the other three factors are derived and to which they are related. If the reproduction of a copyrighted work reduces the potential market and therefore the potential profits of the copyright owner, its fair use is questionable.

Applying these four factors to computer software, the fair use concept actually dashes any hopes educators might have for special privileges in terms of copying instructional software. No matter how altruistic the motivation — making instructional software accessible to large numbers of otherwise deprived students and saving the school district and ultimately the taxpayers "a bundle" — educators will find little support in the fair use provision. The first factor, pertaining to the character and purpose of the use, would be cause for rejoicing if it were the only factor, for most educators wishing to make duplicate copies of software for their students would meet the test of using those copies for educational, nonprofit purposes rather than for direct commercial benefit. However, as mentioned above, even the absence of profit does not in itself protect the person making duplicate copies, and the remaining three factors unequivocably negate the initial advantage this "character and use" factor otherwise appears to provide.

In the case of instructional software, the nature of the copyrighted work is — redundantly — educational rather than merely public. Because it is designed for classroom use and is easily accessible for that use, the copying of educational software is *especially* wrongful as fair use provides the greater protection to material otherwise difficult or impossible to obtain for classroom use.

The amount or portion of the original work that can be legally copied is an even more discouraging consideration for educators hoping that fair use will expand their copyright privileges. One need not be a computer programmer to realize how nearly impossible it is to copy only a portion of a program from a floppy disk or any other medium containing a computer program. And even if it were *possible* to copy only part of a program, the partially copied program would be all but useless anyway. In short, the only likely copying of a master disk involves copying the entire program, thereby failing once again to qualify as fair use.

Finally, the effect of the use upon the potential market is a consideration that clearly renders the copying of instructional software an unfair use, for every copy made and used reduces the potential market accordingly.

Licensing Agreements

If the fair use provision of the copyright act discourages educators who wish to meet the needs of a maximum number of students for a minimum expenditure, there is another source of help — and it also happens to be the one remaining source for determining the legality of specific software use: the license that frequently accompanies a given computer program or set of programs. Such license may be found in manuals or other materials accompanying the disks and usually becomes effective when the packaging is unsealed. Typical of the kind of license defining the legal use of software for individual users/computers is this one from Spinnaker:

> The distribution and sale of this product are intended for the use of the original purchaser only and for use only on the computer system specified. Lawful users of this program are hereby licensed only to read the program from its medium into the memory of a computer for the purpose of executing this program. Copying, duplicating, selling or otherwise distributing this product is hereby expressly forbidden.

Though this license regulates the use of a single program by its owner, increasing numbers of instructional software producers are making available to schools and school districts a variety of licensing agreements. These agreements provide such financially beneficial options as 1) discounts for purchase of multiple copies; 2) permission to duplicate the number of copies required to adequately meet student needs; and 3) software designed for — or permission to modify the software for — use in a computer network. Whatever the license provisions, however, users should understand that any licensing restrictions more stringent than the copyright law itself take precedence over that law which is operative absent licensing provisions.

Penalties for Infringement

Section 504 of title 17 specifies the penalties and remedies for infringement of copyright. In general terms, one who infringes copyright is liable *either* for actual damages and any profits accrued from

the illegal copying *or* for statutory damages. The copyright owner has, in fact, two choices of remedies. He or she may elect to recover actual damages (profits lost) and profits earned by the infringer(s). This remedy is an unlikely one if educators are the infringers, however, since in most cases they will have made no profits and the amount of damages will be negligible.

The liability of educators, then, is more likely to be the second option: statutory damages. In this case, the copyright owner may choose one of two alternatives. First, at any time before final judgment is rendered, the copyright owner may agree to accept an award of statutory damages ranging between $250 and $10,000, at the discretion of the court. Second, if the copyright infringer is found to have committed that infringement *willfully,* the court may award the copyright owner up to $50,000 in statutory damages; if, on the other hand, the court finds that the infringer "was not aware and had no reason to believe that his or her acts constituted an infringement of copyright," the court may at its discretion reduce the award of statutory damages to not less than $100.

Implications for Legal Use of Instructional Software in the Schools

Educators tend to react with disbelief and often defiance when first informed of the copyright act and its impact on the potential use of instructional software in the schools. Much of the frustration, of course, arises from what is perceived to be the exhorbitant cost of providing instructional software to all students. Several factors, however, mitigate the otherwise harsh implications of copyright restrictions for the schools.

First, technological advances are making and will continue to make duplication of tangible copies increasingly difficult. Much instructional software now is copy-protected and copiable only by relatively sophisticated computer-users. In their efforts to control a piracy, software producers are developing increasingly sophisticated means of making their products functional only as intended. Second, to the extent that schools move in the direction of networking, software producers will design programs specifically for use in networks — whether networks of microcomputers or networks consisting of one "master" (intelligent) computer connected to multiple "slave" (dumb) terminals. In these networks, educators will either be using network-designed software in compliance with the intended use and market effect tests or they will be able to obtain the appropriate licensing agreement to modify purchased software for use on their networks. Finally, as indicated above, licensing agreements are

available or can be negotiated to enable school districts to make instructional software accessible to large numbers of students at a significantly more cost-effective rate than now burdens most schools.

Informed of these and other innovative options, educators in the near future may find these and other options rendering the copyright law less directly restrictive for their needs and uses. Though no less enforceable, the impact of the copyright law will decline in the light of technologically more sophisticated copy-protection devices, more software designed for networking and other school uses, greater amounts of high quality/low cost software by non-profit producers such as the Minnesota Educational Computing Consortium (MECC), and more expansive licensing agreements. Until these conditions become more prevalent, however, it is imperative that educators know and abide by the restrictions placed on the use of instructional software by the copyright law.